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Precellys®24

LYSIS & HOMOGENIZATION AUTOMATED EQUIPMENT

User manual

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1 Introduction

This user manual includes the required information regarding unpacking, installation, operation and maintenance of the PRECELLYS®24 lyser / homogeniser.

The product's technical specifications and the following information are subject to change without prior notice.

1.1 Safety Information

This user manual must be read carefully before operating the PRECELLYS®24 lyser / homogeniser.

If there is any doubt or concern about the safety of the equipment, please contact your local distributor.

1.1.1 Risk of Electric Shock

Although this equipment is fully insulated and grounded, it is important for all users to be aware of the potential hazard of using liquids close to a power supply. If any liquids are spilled, disconnect immediately the instrument from the main power supply (remove the power cord from the AC power input on the rear panel) and clean the equipment and the surrounding area.

Do not reconnect the equipment until it has been fully inspected.

1.1.2 Incorrect Operation

Operating this equipment in other ways than those detailed in this user manual may impair the protection of the unit.

- **Do not** turn the unit upside down: the PRECELLYS®24 must always rest on its 4 feet for fear of damaging internal components or breaking plastic casing.
- **Do not** operate the unit when the casing is removed; potentially lethal voltage exists within the instrument.
- **Do not** operate the unit with the safety ground disconnected.
- **Do not** install unauthorised cards, spare components or accessories as this may impair the safety of the unit and the warranty will be void.
- **Do not** overfill the tubes as this may lead to liquid contamination and impair the safety of the unit.
- **Check** that the voltage indicated on the rear panel of the unit matches to the local power supply.
- **Check** that the power cord is properly plugged-in. Colour codes are as follows:

	International Code	USA Code
Phase Live	Brown	Black
Neutral	Blue	White
Earth / Ground	Yellow & Green	Green

Bertin Technologies is not responsible for any damage or injury that may occur as a result of operating the instrument in a different way to that stated in this document.

1.1.3 Fuses

The equipment contains one replaceable external fuse located on the rear panel. If the fuse is to be replaced, please use the following fuse 5x20 – T 10 A – H 250 V. It can easily be replaced by the user with a screwdriver (see §8.2).

1.1.4 Biological Risks

Wear gloves when handling samples and follow strictly all of the safety instructions related to bio-hazardous agents to prevent any risk of contamination.

The waste produced by the normal operation of the instrument must be disposed of in biological waste containers and handled by specialised companies.

1.1.5 Warning Symbols

The following symbol can be found in various places on the PRECELLYS®24 :

Ne pas ouvrir le capot lors du fonctionnement.

Do not open the cover while running.

Please follow instructions associated with this symbol.

The equipment can only be repaired by either the authorised distributor or the manufacturer.

1.1.6 Noise Level

The equipment's noise level is below 70 dBa when in operating mode at a speed of 6500 rpm.

1.1.7 Electromagnetic Interference

WARNING:
This is a Class A apparatus. The equipment may cause radio-electric interference in a residential environment. In this case, it is recommended that the user takes appropriate measures.

1.1.8 Intensive Use

If this device is used in an intensive manner (high speed, long cycle duration, fully loaded with 24 tubes, high number of cycles), the temperature of the system will increase. The increased temperature level may cause the thermal security protection to function. In this case, the electrical power input of the motor will be cut automatically to avoid the overheating of this device.

1.2 Warranty

Bertin Technologies certifies that this product is free of defects at the time of shipment.

This warranty is limited to a period of one (1) year and it does not apply to the following parts: fuses, toric joint, containment seal and indented plate.

This warranty is not aplicable in the following circumstances :

- The equipment has not been installed, operated or maintained according to the instructions described in this user manual.
- The equipment has been repaired or modified by unauthorised personnel.
- The equipment serial number has been damaged or removed.

1.3 Precellys®24's Reference

Code : PRECELLYS 03119.200.RD000

1.4 Manufacturer Information

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1.5 Technical Support

First, read this user manual very carefully. If you cannot solve the problem after having used this manual, please contact the nearest distributor's office or Bertin Technologies' Customer Support Department located in France (see the address above).

2 Description of the PRECELLYS®24

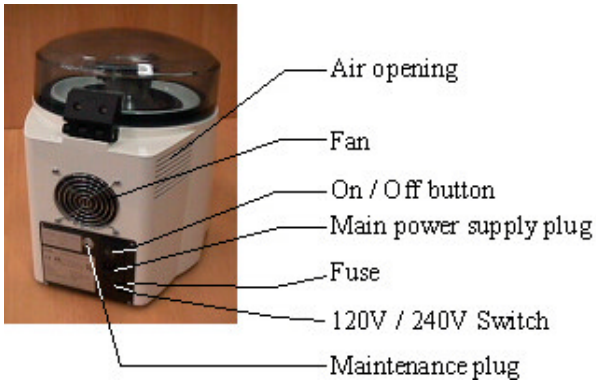
2.1 Product Overview

The PRECELLYS®24 lyser / homogeniser has been designed to lyse and to homogenise biological samples contained in grinding tubes, at variable speeds. It can simultaneously agitate 24 tubes with biological sample volumes of 1.4 ml at very high speed.

Precellys®24's main advantages include:

- Easy tube loading : an innovative system automatically blocks the grinding tubes during operation.
- Easy decontamination : zones which have to be decontaminated are easily accessible.
- Flexible and easy cycle programming (time, speed…).
- No alteration of the biological samples and no cross-contamination.
- Efficient and homogeneous lysis in all 24 tubes.

The PRECELLYS®24 lyser / homogeniser is shown hereafter :



2.2 Tube Motion

Due to the equipment's design and symmetry, the 24 tubes strictly follow the same motion. This ensures the same level of lysis and homogenisation for each sample.

The centre of gravity of the tubes follows a complex path on a sphere's surface. While the mixture contained in grinding tubes moves in all directions, it moves primarily in the vertical axis to allow for efficient homogenisation. The movement generated by the PRECELLYS®24 equipment is called a "precession" movement (i.e. grinding tubes are not rotated).

Each tube has a clearance of ± 8 mm depending on the main vertical axis.

These tubes must be compatible with the holder and they must withstand an acceleration of 600 g for 5 minutes without any deformation (see recommended reference for tubes § 2.5).

Biological sample homogenisation causes the temperature of the samples and the equipment to increase.

2.3 Programming

The PRECELLYS®24 lyser / homogeniser has been designed to operate at a maximum speed of 6,800 rpm. A run consists of one or several cycles, between which the cover must not be opened.

Speed as well as other settings can be adjusted both in program 1 and program 2:

Parameter	Operating range
Speed	From 5,000 to 6,800 rpm in increments of 100 rpm
Number of cycles	From 1 to 3
Cycle duration	From 5 to 90 seconds in increments of 1 second
Waiting time between 2 cycles	From 5 to 120 seconds in increments of 1 second

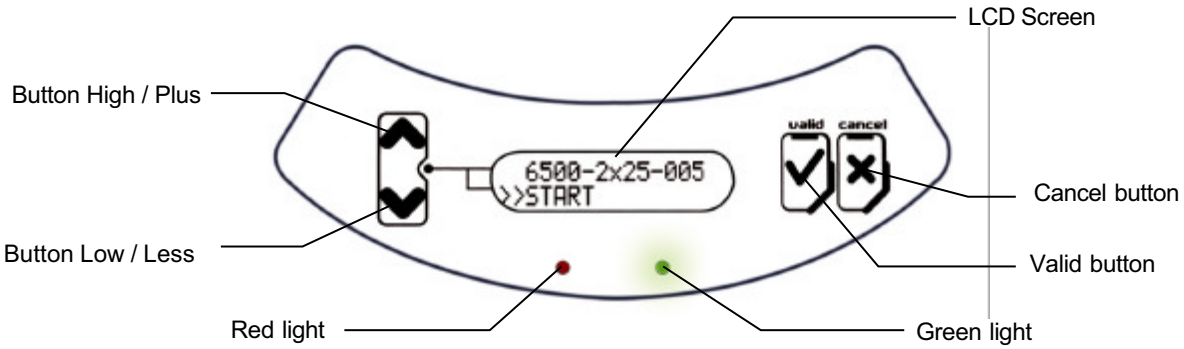
The operator is responsible for programming the unit. For each speed range, the manufacturer recommends an operating range to prevent abnormal temperature rise. See § 6.3 for further details.

For high speed operation, it is recommended to reduce each cycle duration and let the unit cool down between 2 cycles (at least 2 minutes). A security device disables the unit to prevent overheating.

2.4 Presentation of the Keypad

The LCD screen lights up when the PRECELLYS®24 equipment is switched on. These messages guide you for programming and controlling the cycles.

The keypad (see diagram below) consists of a LCD screen, 4 buttons and 2 lights (green, red).



The user can adjust four different homogenisation settings (see § 6) with this interface.

Buttons called “High / Plus” and “Low / Less” are used to navigate through the menu and to adjust parameters.

When used for navigation, the “High / Plus” and “Low / Less” buttons can be used to move the selection cursor. The same buttons also allow the adjustment of the homogenisation parameters.

Note:

- The green light can have 3 different states : on, flashing or off.
- The red light can have 3 different states : on, flashing or off.

2.5 Technical Features

Technical characteristics		
Power requirements	230 V – 50 Hz (standard Europe) 110 V – 60 Hz (standard US)	
Power consumption	<1 kVA	
Fuse specifications	5x20 – T 10 A – H 250 V	
Safety	Class I apparatus	
Physical / Environmental conditions		
Length	290 mm	
Width	375 mm	
Height	370 mm	600 mm cover open
Weight	29,8 kg	
Operating temperature	15-30°C	
Humidity	15-85 % HR	
Altitude	< 2000 m	
Operating characteristics		
Speed	5,000 – 6,800 rpm	
Number of cycles	1 – 3	
Cycle duration	5 – 90 s	See adjustment limit § 6.3
Waiting time between 2 cycles	5 – 120 s	See adjustment limit § 6.3
Rest time between 2 consecutive runs	2 – 5 min	See adjustment limit § 6.3
Acceleration time	< 4 s	
Deceleration time	< 4 s	
User interface		
Keypad	4 buttons	
Display	A 2 line LCD screen, 16 characters, back-light 2 lights (1 green, 1 red)	
Capacity		
Number of tubes	Up to 24	Total volume : 2 ml/tube Sample volume : 1.4 ml/tube

For tubes, recommended references are the PRECELLYS®24 grinding kits :

- 03961CK14-03961CK28 : lysis of tissues/vegetals (kidney, liver, heart…)
- 03961MK28 : lysis of tissues/vegetals (muscles, hair, teeth, lung, muscles…)
- 03961VK05 : lysis of microorganisms (bacteria, yeast, fungi, spores…)

3 Transport / Storage

3.1 Transport

Avoid violent shocks that may damage the equipment.

Before transporting the equipment, it is necessary to:

1- Place the protection foam under the cover.

2- Close the cover.

3- Block the cover with adhesive tape.

3.2 Storage

The unit must be stored in a dry area at a temperature ranging from +0°C to +50°C.

4 Installation

WARNING:

Do not connect the unit to the main supply before the installation is over.

Do not turn the unit upside down: the PRECELLYS®24 must always rest on its 4 feet for fear of damaging internal components or breaking plastic casing.

4.1 Unpacking

1) Check the content of the box. The box must contain the following items:
   - 1 user manual (French / English)
   - 1 PRECELLYS®24 (with 1 indented plate and 1 toric joint)
   - 1 AC power cord (European plug*)
   - 1 extra toric joint
   - 1 spare fuse
   - 1 EC Declaration of Conformity
   - 1 QC report

   Should one of these items be missing, please contact immediately your local distributor's office.

   * A plug adapter or a compatible power cord (not included) is required for the UK and other countries such as the USA, Canada, Japan, etc.

2) Remove the PRECELLYS®24 from the box and place it on a clean, horizontal and stable surface (weight = 29.8 kg).

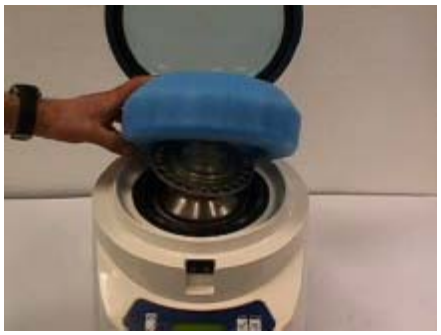
   WARNING :

   To remove the unit from the box, do not lift it by holding the cover. It must be removed by holding the notches located on both sides of the unit. For more convenience, notches are also present in the protective foam.

3) Unpack the PRECELLYS®24 with care and inspect it carefully. Report any damage to the carrier immediately.
4) Save the packaging material, in case a return is necessary.

4.2 Installation and Connecting the Power Supply

1. Remove the protective foam located around the holder under the cover.



WARNING :

Save this protective foam, as it must ABSOLUTELY be put back in place before shipping the unit. If the unit is returned to the distributor or manufacturer without this protection in place, the warranty will be void.

2. Put the toric joint in place (see § 8.2.2).
3. Check that the voltage switch located at the back of the unit matches the voltage delivered by your electric power supply (see § 2.1).

WARNING :

If the voltage supplied to the equipment is higher than that indicated on the voltage switch (see the rear side of the equipment), the electronics can be irreversibly damaged.

4. Ensure that both air openings and the cooling fan are clear.

WARNING :

Allow at least 15 cm of space around air inlets and outlets for proper motor ventilation.

5. Plug the PRECELLYS®24 into the power supply using a compatible power cord.

WARNING :

This equipment must be powered from a main supply which has a protective ground terminal.

5 Instructions for Use

5.1 Preparing Samples

The samples have to be prepared in the tubes recommended by Bertin Technologies (see § 2.5).

WARNING :

Each tube has to be filled with 1,4 ml of the sample .

5.2 Starting a Run

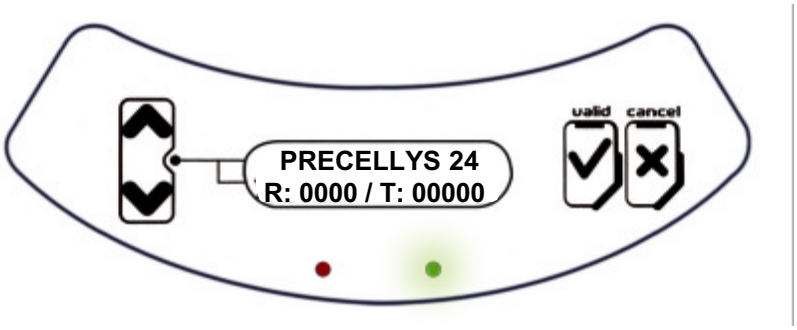
5.2.1 Turning on the Equipment

Turn the PRECELLYS®24 on by pressing the ON/OFF button located on the rear panel near the AC power input.

5.2.2 Starting Information

When the unit is turned on, a welcome screen is displayed for a few seconds showing the following information:

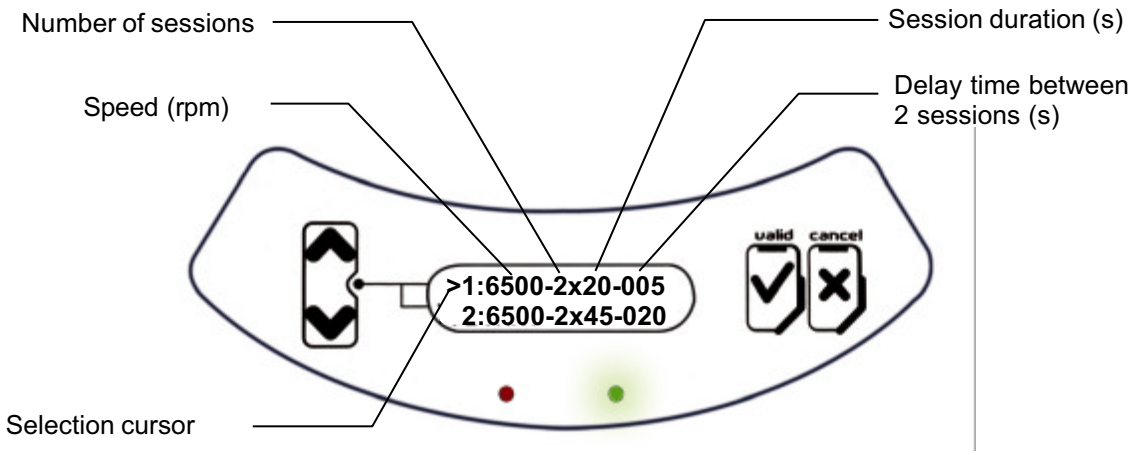
- Precellys 24 Name of the equipment
- R : Number of runs done by the equipment since last reset (see § 8.3)
- T : Operating time (in minutes) corresponding to these runs



Red light is off / green light is on

5.2.3 Main Menu

After starting the unit, a menu displays program 1 and program 2:

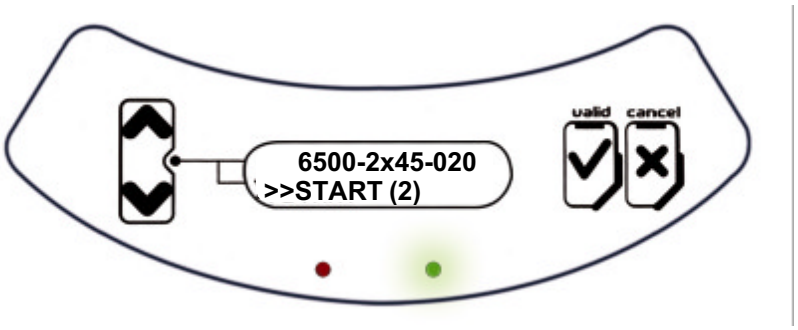


Red light is off / green light is on

For both programs, the homogenisation settings can be modified and the unit stores parameters defined during the last executed cycle (see § 6) ; the default parameters are :

- Program 1 : 6500-2x20-005
- Program 2 : 6500-2x45-020

The selection cursor allows to choose the program to be started. The cursor can be moved by using the “Up” and “Down” buttons. By pressing the “Valid” button, the selected program is displayed on the screen.



Red light is off / green light is on

The “Start” command is selected by default. By pressing the “Valid” button, the run starts.

The cursor can be moved by pressing the “Up” and “Down” buttons. Selecting the upper line allows to modify the homogenisation settings (see § 6).

By pressing the “Cancel” button, the main menu listing both homogenisation programs is displayed.

5.2.4 Opening the Cover

WARNING:

Never open the cover while the unit is running.

To open the cover, push the locking handle and raise the cover until you reach a stop.

5.2.5 Loading Grinding Tubes

Grinding tubes (filled with samples) are placed on the holder, and are held down with the indented plate. The latter has to be removed for loading and unloading tubes.

A vacuum system holds the indented plate onto the holder. The indented plate's prongs maintain tubes in place while the unit is running, and tubes are freed when the vacuum stops (a few seconds after the end of the run).

1. Remove the indented plate.
2. Place grinding tubes symmetrically onto the holder.
3. Put the indented plate back in place.

Note : When loading tubes, make sure that:

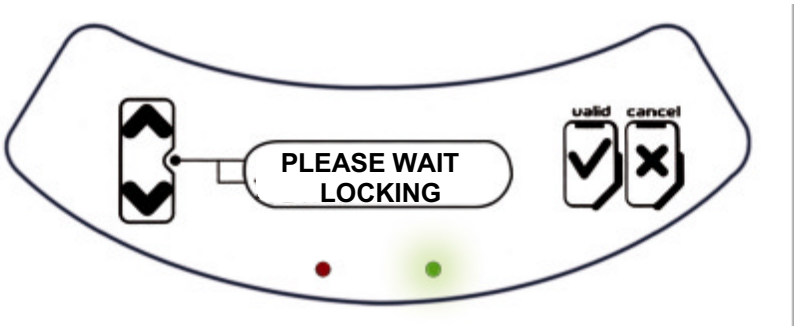
- ✓ The toric joint is properly installed on the holder's groove.
- ✓ The indented plate must be centred on the holder and placed on the toric joint. A positioning guide helps the operator to place the indented plate properly.

5.2.6 Closing the Cover

Close the cover until the locking handle is locked.

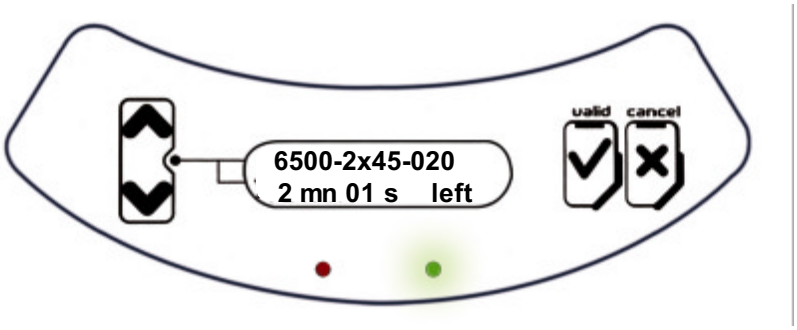
5.2.7 Running a Program

When starting a program by pressing the "Valid" button, the unit puts the indented plate in depression; during this phase, the following message is displayed:



Red light is off / green light is on

When tubes are properly held (i.e. depression is sufficient), the run starts, the green light flashes and the following indications are displayed on the screen:



Red light is off / green light is flashing

A timer (in minutes and seconds) counts down the remaining time before the end of the run. This time takes into account both acceleration (< 4 s) and deceleration (< 4 s) stages.

5.2.8 Ending a Run

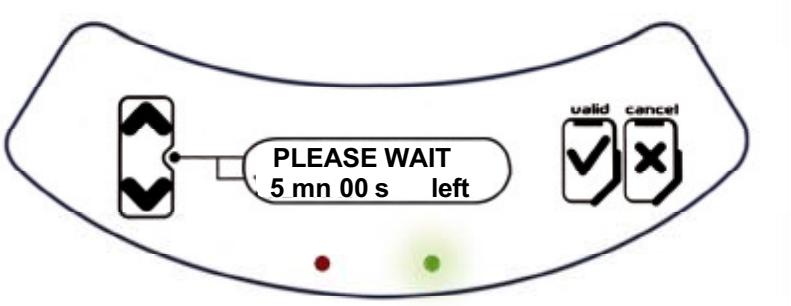
WARNING :

Wait until the complete stop of the unit before opening the cover.

At the end of a run, the holder is stopped and the unit displays the main menu. The depression under the indented plate stops about 5 seconds after the unit stops. The indented plate cannot be removed from the holder during this time.

Note:

- Homogenisation settings cannot be changed once the run is in progress, to prevent any operator's mistake.
- At the end of each run and for safety purposes, the unit will automatically be unavailable for a short period of time, depending upon the programmed speed level and cycle duration. The message "PLEASE WAIT" is displayed and the red LED is on.



Red light is on / Green light is off

WARNING :

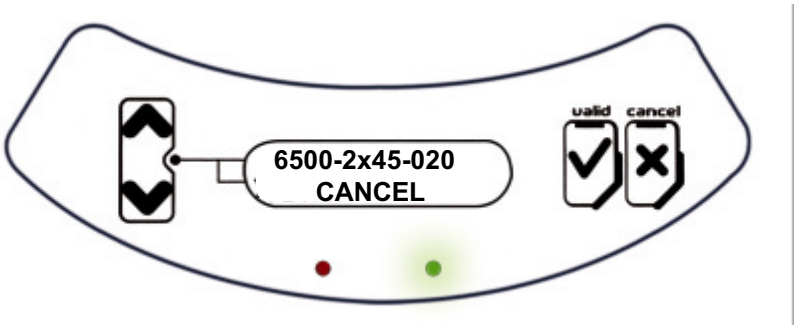
To prevent overheating, a rest period of 2 to 5 minutes between runs is strongly recommended, as indicated on the LCD screen.

5.2.9 Interrupting a Run

WARNING :

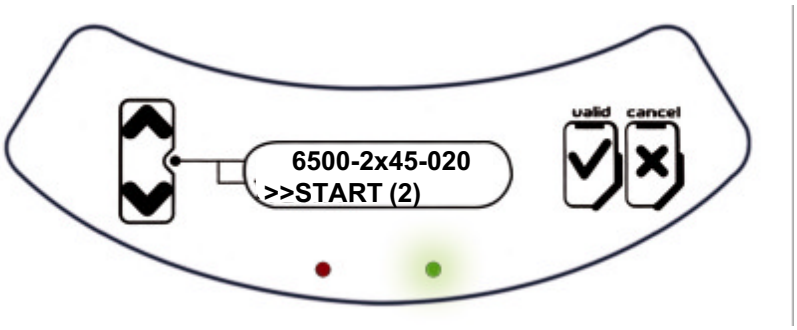
Wait until the complete stop of the unit before opening the cover.

The user can stop a run by pressing the **Cancel** button at any time. The unit displays the **CANCEL** information until the run has completely stopped.



Red light is on / green light is off

After the complete stop of the unit, the LCR screen displays the following sub-menu:



Red light is on / green light is off

The depression under the indented plate stops about 5 seconds after the unit stops. The indented plate cannot be removed from the holder during this time.

6 Adjusting Parameters

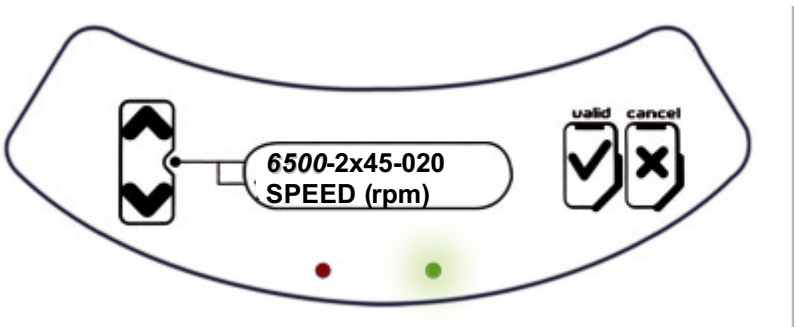
6.1 Accessing the Parameter Adjustment Menu

From the sub-menu, the user can adjust the settings of program 1 and program 2, by moving the cursor to the line 1 with the “Up” button, then pressing the “Valid” button.

6.2 Parameters Adjustment Menu

6.2.1 Adjusting the Speed

When the adjustment menu is selected, the following message is displayed and the speed value flashes:



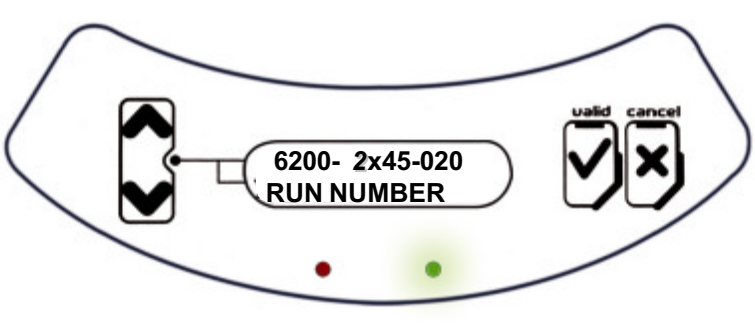
Red light is off / green light is on

The user can change the speed value using the “Up” and “Down” buttons. The speed adjustment ranges from 5,000 rpm to 6,800 rpm in increments of 100 rpm.

When the desired value is reached, the user can select it by pressing the “Valid” button or return to the previous menu by pressing the “Cancel” button.

6.2.2 Adjusting the Number of Cycles

Once the speed is adjusted, the following message displays on the screen and the number of cycles flashes:



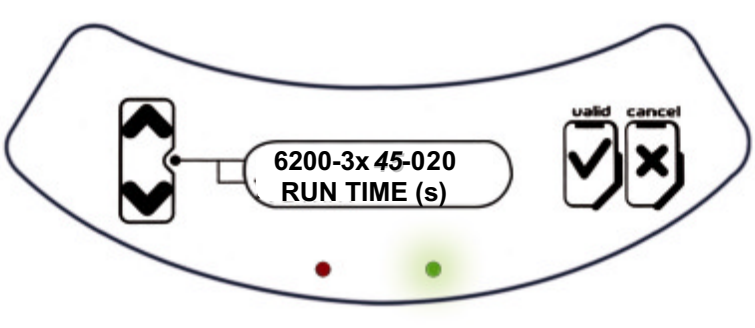
Red light is off / green light is on

The user can change the number of cycles using the “Up” and “Down” buttons. The number of cycles ranges from 1 to 3.

When the desired value is reached, the user can select it by pressing the “Valid” button or return to the previous menu by pressing the “Cancel” button.

6.2.3 Adjusting the Duration of the cycle

Once the number of cycles is adjusted, the following message displays on the screen and the duration of the cycle flashes:



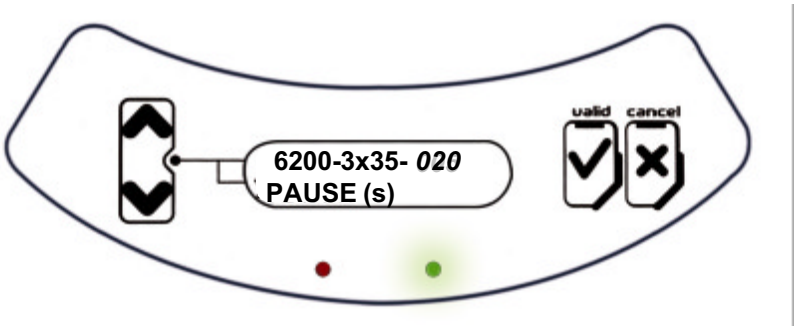
Red light is off / green light is on

The user can change the cycle’s duration using the “Up” Down” buttons. The cycle’s duration ranges from 5 seconds to 90 seconds in increments of 1 second.

When the desired value is reached, the user can select it by pressing the “Valid” button or return to the previous menu by pressing the “Cancel” button.

6.2.4 Adjusting of Waiting Time between 2 Cycles

Once the cycle's duration is adjusted, the following message displays on the screen and the waiting time between 2 cycles flashes:



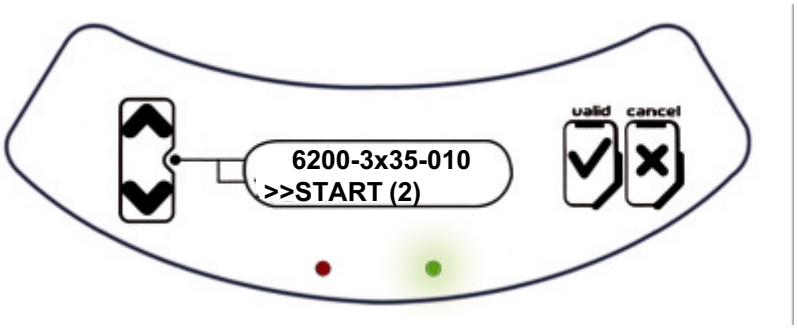
Red light is off / green light is on

The user can change the waiting time between 2 cycles using the "Up" and "Down" buttons. The waiting time between 2 cycles ranges from 5 seconds to 120 seconds in increments of 1 second.

When the desired value is reached, the user can select it by pressing the "Valid" button or return to the previous menu by pressing the "Cancel" button.

6.2.5 Ending the Parameter Adjustments

Once the waiting time between 2 cycles is adjusted, the sub-menu is displayed on the screen showing the new program 2 parameters. This program can be started by selecting the "START (2)" line and then by pressing the "Valid" button.



Red light is off / green light is on

When returning to the sub-menu, the unit automatically saves the new parameters.

6.3 Operating Ranges for Parameter Adjustments

In order to assure the optimal operation of this device, it is possible to use the parameters indicated in the table below:

Speed (rpm)	Run Number	Run Time (s)	Pause (s)	Waiting time between 2 cycles
5000 to 6200	1 to 3	5 to 90	5 to 120	2 to 5 mn
6300 to 6500	1 to 3	5 to 30	5 to 120	5 mn
		31 to 60	15 to 120	
6600 to 6800	1 to 3	5 to 30	30 to 120	5 mn

Note:

- A temperature sensor is used to automatically disconnect the engine power supply (instant stop of the system) in case of important overheating. This alarm can be triggered during a run. When the warning message appears on the display (see § 7.2.4), it is necessary to apply the procedure described in § 7.3.

7 Alarms

WARNING:

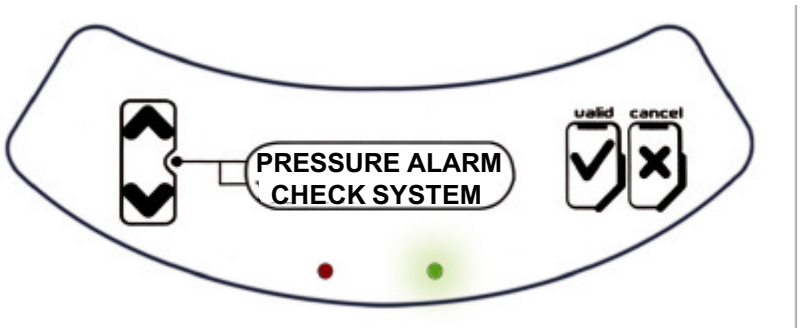
Do not open the cover when the sample holder is moving.

7.1 Alarm Messages before Starting a Run

When the user presses the "Valid" button to start a run, the system checks information from the different sensors before allowing a run to start:

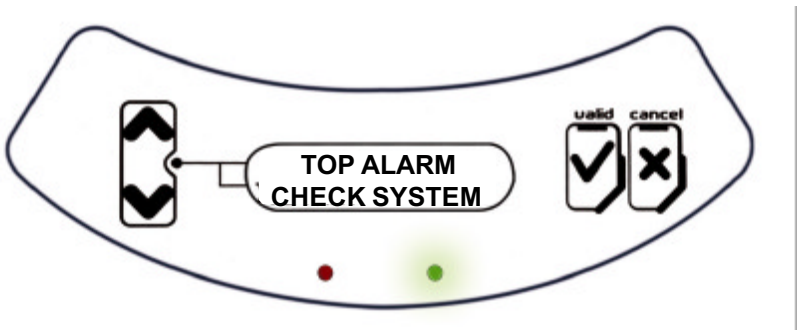
- Pressure sensor,
- Cover sensor.

When the pressure is insufficient, the following message is displayed on the screen:



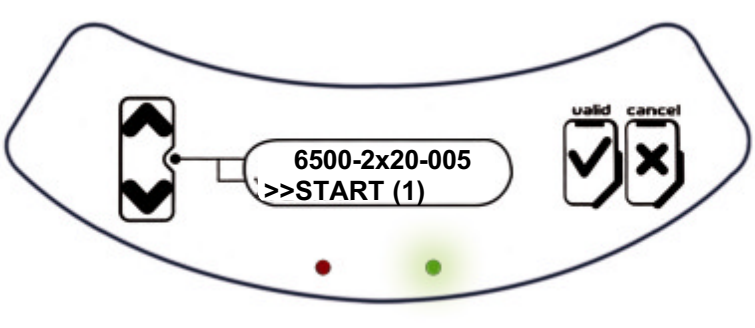
Red light is flashing / green light is off

If the cover is not closed properly, the following message is displayed on the screen:



Red light is flashing / green light is off

The alarm display lasts 5 seconds, then the unit returns to the sub-menu:



Red light is off / green light is on

Actions to be done in case of alarm are described in § 7.3.

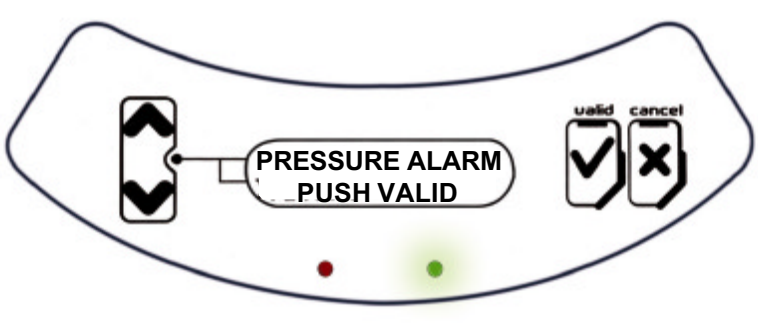
In case of a pressure alarm, the vacuum pump keeps running for 10 seconds, in order to allow the user to reposition the indented plate properly.

7.2 Run Interruption by Alarm Messages

A run in progress can be stopped by alarm messages.

7.2.1 Pressure alarm

If the pressure under the indented plate increases when a run is in progress and the unit can no longer hold the indented plate down, the pressure alarm is set off. The run stops immediately and the following message is displayed on the screen:



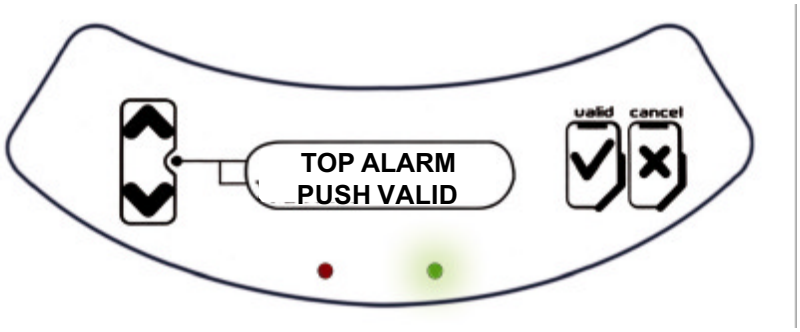
Red light is flashing / green light is off

To return to the main menu, the user must press the “Valid” button.

Actions to be done in case of alarm are described in § 7.3.

7.2.2 Cover Alarm

If the cover is opened while a run is in progress, the cover alarm sets off and the run stops immediately. The following message is displayed on the screen:



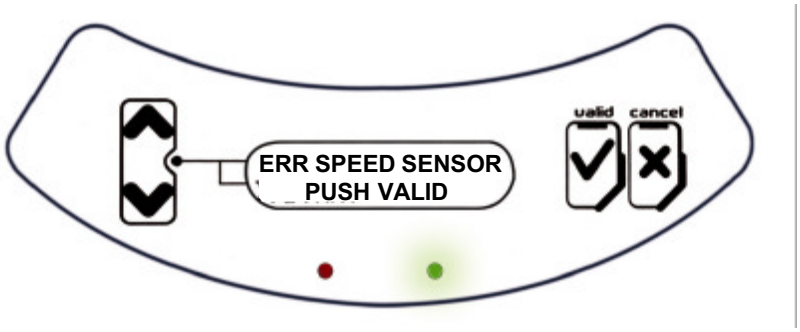
Red light is flashing / green light is off

To return to the main menu, the user must press the “Valid” button.

Actions to be done in case of alarm are described in § 7.3.

7.2.3 Speed Error Alarm

If the actual speed is different from the assigned speed, the speed error alarm sets off and the run stops immediately. The following message is displayed on the screen:



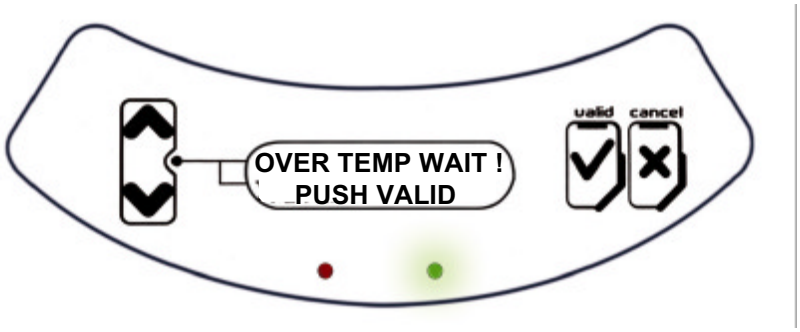
Red light is flashing / green light is off

To return to the main menu, the user must press the “Valid” button.

Actions to be done in case of alarm are described in § 7.3.

7.2.4 Engine Temperature Alarm

If the engine temperature reaches the safety limit before overheating the instrument, the engine temperature alarm sets off and the run stops immediately. The following message is displayed on the screen:



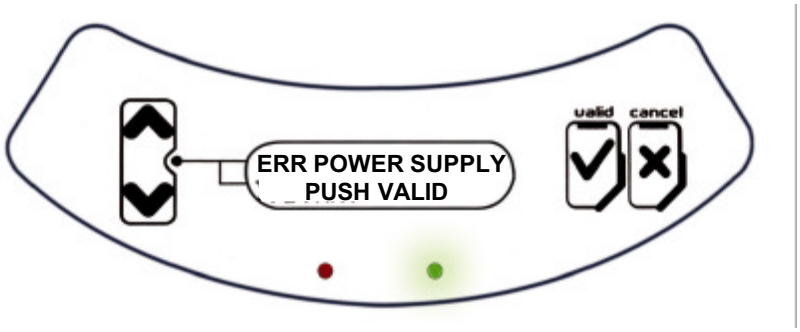
Red light is flashing / green light is off

To return to the main menu, the user must press the “Valid” button.

Actions to be done in case of alarm are described in § 7.3.

7.2.5 Power Supply Alarm

If a synchronization error with the power supply occurs, the power supply alarm sets off and the run stops immediately. The following message is displayed on the screen:



Red light is flashing / green light is off

To return to the main menu, the user must press the “Valid” button.

Actions to be done in case of alarm are described in § 7.3.

7.3 What to Do When an Alarm Message Occurs

Alarm message	Possible cause	Action(s)
Pressure alarm	Tubes (recommended by Bertin Technologies, see § 2.5) are not positioned properly.	1. Reposition the grinding tubes on the holder. 2. Press in the middle of indented plate during depression phase (cover open).
	The indented plate is not positioned properly.	Reposition the indented plate on the holder and make sure the indented plate is placed properly using the positioning guide.
	The toric joint is not positioned properly.	Reposition the toric joint on the holder and make sure it is adjusted properly to the holder's groove.
	The indented plate is damaged.	Replace indented plate.
	The toric joint is damaged.	Replace toric joint.
	The vacuum is not working properly.	1. Turn off the unit. 2. Contact technical assistance.
Top alarm	The cover is not locked properly.	1. Check that nothing prevents the cover from closing. 2. Press cover and ensure the handle is locked properly.
	Detection system is faulty.	1. Turn off the unit. 2. Contact technical assistance.
Err speed sensor	Speed regulation or detection system is faulty.	1. Turn off the unit. 2. Contact technical assistance.
Over temp wait !	Engine temperature has reached the safety limit.	1. Leave the unit on so that the motor ventilation can run. 2. Ensure air openings and the cooling fan are clear. 3. After 30 minutes of cooling, if the alarm is still on, contact technical assistance.
	Detection system is faulty.	1. Turn off the unit. 2. Contact technical assistance.
Err power supply	Power supply is not suitable.	Check the voltage on the back of the unit matches that delivered by the main power supply.
	No synchronization between unit and power supply.	1. Turn off the unit. 2. Contact technical assistance.

8 Maintenance

8.1 Troubleshooting Guide

Common problem	Possible cause	Action(s)
The fan does not work.	No power on the main plug.	1. Check main voltage. 2. Check the voltage of the unit matches that delivered by the main power supply. 3. Check the unit is plugged in properly.
	Faulty fuse.	Replace fuse.
	Faulty cooling system.	1. Turn off the unit. 2. Contact technical assistance.
No display on the screen.	No power on the main power plug.	1. Check main power voltage. 2. Check the voltage of the unit matches that delivered by the main power supply. 3. Check the unit is plugged in properly.
	Faulty fuse.	Replace fuse.
	Faulty display system.	1. Turn off the unit. 2. Contact technical assistance.
One or several tubes are not tight.	The cap is not properly screwed or the tube is faulty.	If a dangerous or potentially-dangerous product is contained in the tube, apply the proper decontamination procedure.
Power cut.	-	For safety purposes, the indented plate is held down by depression. Turn the unit back on to remove the indented plate.

8.2 Replacing Spare Parts

This paragraph lists the maintenance actions to be done by user on a regular basis, to ensure PRECELLYS®24 runs properly.

Wearing parts are:

Wearing parts	Reference	Frequency of replacement	Why?
Indented plate	03119.810.NC002	1 year or to destruction	Necessary to maintain tubes during homogenisation
Toric joint	03119.810.NC003	6 months or to destruction	Necessary to maintain tubes during homogenisation
Containment seal	03119.810.NC004	1 year or to destruction	Necessary to ensure the instrument's tightness
Fuse	03119.810.NC005	To destruction	-

WARNING:

Potentially dangerous voltage exists inside the instrument. In order to ensure the user's safety, the containment seal should not be damaged in particular during the cleaning and/or decontamination procedures.

Do not turn the unit upside down: the PRECELLYS®24 must always rest on its 4 feet for fear of damaging internal components or breaking plastic casing.

8.2.1 Replacing Indented Plate

The indented plate can show signs of wear over time. Replace it once a year.

8.2.2 Replacing Toric Joint

The toric joint located on the holder can show signs of wear over time. It should be replaced when the "Pressure Alarm" message is displayed permanently. It is however recommended to replace it at least once every six months.

8.2.3 Replacing Containment Seal

The containment seal should be replaced at least once a year. It does not require the dismantling of the holder.

WARNING:

Turn off the system and unplug power cord before replacing the containment seal.

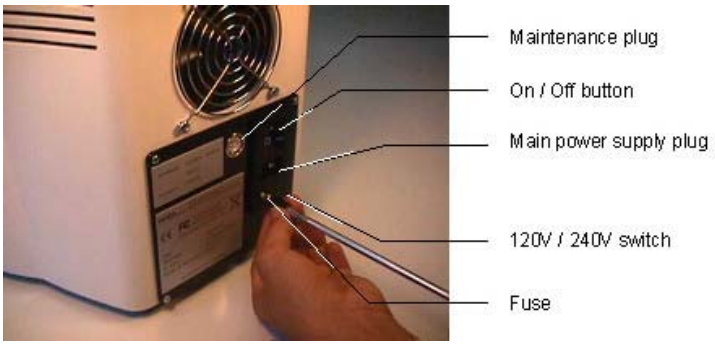
1. Insert the interior part of the containment seal onto the metallic edge.
2. Insert the exterior part of the containment seal onto the casing.

8.2.4 Replacing fuse

A screwdriver is required to replace the fuse.

WARNING:

Turn off the system and unplug power cord before replacing the fuse.



8.3 Service Menu

8.3.1 Information Available

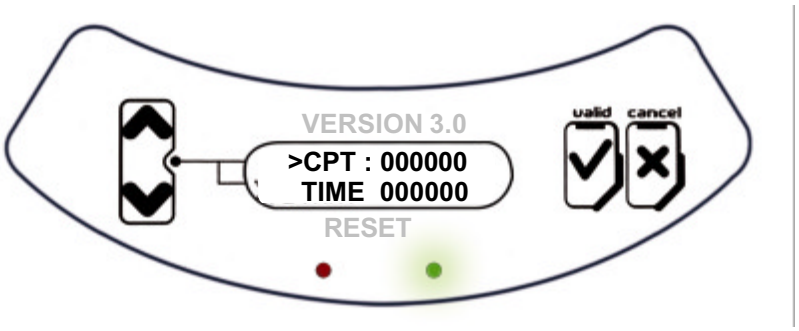
The unit firmware gives access to a "Service" menu presenting the following information, useful for maintaining the system:

- ❖ VERSION : Firmware version.
- ❖ CPT : Cycle's absolute counter device: accumulated number of cycle done by the unit.
- ❖ TIME : Running time absolute counter device: time associated to the number of cycle run by the unit (running total only during cycle duration).
- ❖ RESET : Reset: the cycle counter device and the associated running time counter device when the unit is switched on (see § 5.2.2) can be reset after each system maintenance.

8.3.2 Access to Service Menu

To access service menu, from the main menu, the user pushes the "Cancel" button for approximately 5 seconds.

The service menu is an unwind menu on 4 lines, the screen displays 2 lines at a time. "Up" and "Down" buttons move selection cursor in this menu:



To reset all counter devices, the user can choose the RESET line on the menu with the cursor and must push the "Valid" button. The system starts again and return to the main menu.

To exit service menu without resetting counter devices, the user must push the "Cancel" button (whatever line is selected).

8.4 Cleaning and Decontamination

8.4.1 Recommendations

The casing of the unit can be cleaned up with a sponge or a damp cloth, moistened with water or alcohol.

WARNINGS:

For safety purposes and to prevent any damage of the unit, the recommendations listed below should be strictly followed:

- **Do not** spray water or alcohol directly on the unit, especially in the air openings and the fan.
- Always disconnect the power cord before cleaning.
- **Do not** use any type of scrapers.
- **Do not** use caustic soda or acetone.
- **Do not** use an aerial decontamination process.

8.4.2 Example of Decontamination Procedure

If a tube breaks when a run is in progress, decontaminate parts that may have been contaminated with an appropriate disinfectant.

The decontamination procedure is of the sole responsibility of the user.

Parts that may have been contaminated can be cleaned with a sponge or a damp cloth moistened with bleach at 6° Cl.

In case another decontamination procedure is to be applied, please first contact technical assistance to ensure the compatibility of the new procedure with the instrument.

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User Manual code : 03720-800-DU004 D
Revised : AGUST 2005 – English
Printed : AGUST 2005
Code: PRECELLYS 03119.200.RD000